Deriválás

$f(x)$	$f'(x)$
c	0
x^α	$\alpha x^{\alpha-1}$
e^x	e^x
a^x	$a^x \ln(a)$
$\ln(x)$	$\frac{1}{x}$
$\log_a x$	$\frac{1}{x \ln(a)}$
$\sin(x)$	$\cos(x)$
$\cos(x)$	$-\sin(x)$
$\operatorname{tg}(x)$	$\frac{1}{\cos^2(x)}$
$\operatorname{ctg}(x)$	$-\frac{1}{\sin^2(x)}$
$\arcsin(x)$	$\frac{1}{\sqrt{1-x^2}}$
$\arccos(x)$	$-\frac{1}{\sqrt{1-x^2}}$
$\operatorname{arctg}(x)$	$\frac{1}{1+x^2}$
$\operatorname{arcctg}(x)$	$-\frac{1}{1+x^2}$
$\operatorname{sh}(x)$	$\operatorname{ch}(x)$
$\operatorname{ch}(x)$	$\operatorname{sh}(x)$
$\operatorname{th}(x)$	$\frac{1}{\operatorname{ch}^2(x)}$
$\operatorname{cth}(x)$	$-\frac{1}{\operatorname{sh}^2(x)}$
$\operatorname{arsh}(x)$	$\frac{1}{\sqrt{1+x^2}}$
$\operatorname{arch}(x)$	$\frac{1}{\sqrt{x^2-1}}$
$\operatorname{arth}(x)$	$\frac{1}{1-x^2} \quad \lvert x\rvert < 1$
$\operatorname{arcth}(x)$	$\frac{1}{1-x^2} \quad \lvert x\rvert > 1$

Deriválási szabályok

$$(cf)' = cf'$$
$$(f \pm g)' = f' \pm g'$$
$$(fg)' = f'g + fg'$$
$$\left(\frac{f}{g}\right)' = \frac{f'g - fg'}{g^2}$$
$$(f \circ g)' = (f' \circ g)\, g'$$
$$(\bar{f})' = \frac{1}{f' \circ \bar{f}}$$

Paraméteres megadású függvény:

$$f\colon \quad \begin{cases} x = \varphi(t) \\ y = \psi(t) \end{cases} \qquad f'(x) = \frac{\dot{\psi}(t)}{\dot{\varphi}(t)}$$

Integrálás

$f(x)$	$F(x)$
x^α	$\frac{x^{\alpha+1}}{\alpha+1} \quad \alpha \neq -1$
$\frac{1}{x}$	$\ln\lvert x\rvert$
e^x	e^x
a^x	$\frac{a^x}{\ln(a)}$
$\sin(x)$	$-\cos(x)$
$\cos(x)$	$\sin(x)$
$\frac{1}{\cos^2(x)}$	$\operatorname{tg}(x)$
$\frac{1}{\sin^2(x)}$	$-\operatorname{ctg}(x)$
$\operatorname{sh}(x)$	$\operatorname{ch}(x)$
$\operatorname{ch}(x)$	$\operatorname{sh}(x)$
$\frac{1}{\operatorname{ch}^2(x)}$	$\operatorname{th}(x)$
$\frac{1}{\operatorname{sh}^2(x)}$	$-\operatorname{cth}(x)$
$\frac{1}{\sqrt{1-x^2}}$	$\arcsin(x)$
$\frac{1}{\sqrt{1+x^2}}$	$\operatorname{arsh}(x)$
$\frac{1}{\sqrt{x^2-1}}$	$\operatorname{arch}(x)$
$\frac{1}{1+x^2}$	$\operatorname{arctg}(x)$
$\frac{1}{1-x^2}$	$\frac{1}{2}\ln\left\lvert\frac{1+x}{1-x}\right\rvert$

Integrálási szabályok

$$\int f(ax+b)\,\mathrm{d}x = \frac{F(ax+b)}{a} + C$$
$$\int f^\alpha(x)\, f'(x)\,\mathrm{d}x = \frac{f^{\alpha+1}(x)}{\alpha+1} + C \quad \text{ha} \quad \alpha \neq -1$$
$$\int \frac{f'(x)}{f(x)}\,\mathrm{d}x = \ln\lvert f(x)\rvert + C$$
$$\int f(g(x))\, g'(x)\,\mathrm{d}x = F(g(x)) + C$$
$$\int u(x)\, v'(x)\,\mathrm{d}x = u(x)\, v(x) - \int u'(x)\, v(x)\,\mathrm{d}x$$

$$T = \int_a^b f(x)\,\mathrm{d}x \qquad V = \pi \int_a^b f^2(x)\,\mathrm{d}x$$
$$s = \int_a^b \sqrt{1 + (f'(x))^2}\,\mathrm{d}x$$
$$F = 2\pi \int_a^b f(x)\sqrt{1 + (f'(x))^2}\,\mathrm{d}x$$
$$T = \int_\alpha^\beta \psi(t)\dot{\varphi}(t)\,\mathrm{d}t \quad V = \pi \int_\alpha^\beta \psi^2(t)\dot{\varphi}(t)\,\mathrm{d}t$$
$$s = \int_\alpha^\beta \sqrt{\dot{\varphi}^2(t) + \dot{\psi}^2(t)}\,\mathrm{d}t$$
$$F = 2\pi \int_\alpha^\beta \psi(t)\sqrt{\dot{\varphi}^2(t) + \dot{\psi}^2(t)}\,\mathrm{d}t$$

Laplace-transzformáció

$f(t)$	$\bar{f}(s) = L[f(t)]$
e^{at}	$\frac{1}{s-a}$
$\sin(at)$	$\frac{a}{s^2+a^2}$
$\cos(at)$	$\frac{s}{s^2+a^2}$
t^n	$\frac{n!}{s^{n+1}}$
$\operatorname{sh}(at)$	$\frac{a}{s^2-a^2}$
$\operatorname{ch}(at)$	$\frac{s}{s^2-a^2}$
$e^{at} f(t)$	$\bar{f}(s-a)$
$t^n f(t)$	$(-1)^n \frac{d^n \bar{f}(s)}{ds^n}$
$f'(t)$	$s\bar{f}(s) - f(0)$
$f''(t)$	$s^2\bar{f}(s) - sf(0) - f'(0)$
$f^{(n)}(t)$	$s^n\bar{f}(s) - s^{n-1}f(0) - \ldots$ $\ldots - f^{(n-1)}(0)$
$\int_0^t f(u)\,du$	$\frac{1}{s}\bar{f}(s)$
$f(t-a)$	$e^{-as}\bar{f}(s)$

Taylor-sorok

$$e^x = \sum_{n=0}^{\infty} \tfrac{x^n}{n!}$$
$$\sin(x) = \sum_{n=0}^{\infty} (-1)^n \frac{x^{2n+1}}{(2n+1)!}$$
$$\cos(x) = \sum_{n=0}^{\infty} (-1)^n \frac{x^{2n}}{(2n)!}$$

Fourier-sorok

$$f(x) = a_0 + \sum_{n=1}^{\infty} (a_n \cos(n\omega x) + b_n \sin(n\omega x))$$
$$a_0 = \frac{1}{T} \int_a^{a+T} f(x)\,dx$$
$$a_n = \frac{2}{T} \int_a^{a+T} f(x)\cos(n\omega x)\,dx$$
$$b_n = \frac{2}{T} \int_a^{a+T} f(x)\sin(n\omega x)\,dx$$
$$f(x+T) = f(x) \text{ és } \omega = \frac{2\pi}{T}$$

Kiegészítések

$$\sin^2(x) = \frac{1-\cos(2x)}{2} \qquad \cos^2(x) = \frac{1+\cos(2x)}{2}$$
$$\operatorname{sh}^2(x) = \frac{\operatorname{ch}(2x)-1}{2} \qquad \operatorname{ch}^2(x) = \frac{\operatorname{ch}(2x)+1}{2}$$
$$2\sin(\alpha)\sin(\beta) = \cos(\alpha-\beta) - \cos(\alpha+\beta)$$
$$2\cos(\alpha)\cos(\beta) = \cos(\alpha-\beta) + \cos(\alpha+\beta)$$
$$2\sin(\alpha)\cos(\beta) = \sin(\alpha+\beta) + \sin(\alpha-\beta)$$